



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/784,961	02/25/2004	Hiroki Fujii	2004-0302A	8467
513	7590	12/30/2005	EXAMINER	
WENDEROTH, LIND & PONACK, L.L.P.			RIDDLE, KYLE M	
2033 K STREET N. W.			ART UNIT	
SUITE 800			PAPER NUMBER	
WASHINGTON, DC 20006-1021			3748	

DATE MAILED: 12/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

e

Office Action Summary	Application No. 10/784,961	Applicant(s) FUJII ET AL.	
	Examiner Kyle M. Riddle	Art Unit 3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3 and 8-11 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3 and 8-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The arguments presented in applicant's amendment received 22 September 2005 concerning the material composition of the valve element were deemed persuasive, however, a new non-final rejection is set forth below.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 3 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art on pages 1 and 2, paragraphs 2-4, of the instant application, in view of Edelmayer et al. (U.S. Patent 5,758,613), and further in view of Lane et al. (U.S. Patent 6,681,579) or Niwa et al. (U.S. Patent 6,696,376).

Applicant's admitted prior art discloses a conventional hydraulic lash adjuster comprising:

- a bottomed cylinder fixed to a cylinder head and a plunger accommodated in the cylinder so as to be vertically moved;
- the plunger having an upper end protruding from the cylinder;
- a rocker arm supported on the upper end of the plunger;
- the interior of the plunger serving as a low-pressure chamber;

- a lower interior of the cylinder divided by a bottom wall of the plunger, thereby serving as a high-pressure chamber;

- the bottom wall of the plunger formed with a valve port of a check valve;

- the low-pressure chamber filled with a hydraulic fluid supplied from a fluid supply passage via communication holes formed in the circumferential walls of the respective cylinder and plunger;

- the high-pressure chamber filled with the hydraulic fluid supplied via the valve port of the check valve;

- a spherical valve element accommodated in the high-pressure chamber and biased in such a direction that it closes the valve port;

- the valve element and valve port constituting a check valve;

- the side of the rocker arm applying a downward pressing force to the plunger closing the valve port by the valve element such that the high-pressure chamber is tightly closed, whereupon the hydraulic fluid filling the high-pressure chamber prevents the plunger from moving downward;

- the plunger moving upward such that the volume of the high-pressure chamber is increased and the pressure reduced, the valve element moving downward relative to the plunger, thereby opening the valve port;

- the hydraulic fluid flowing from the low-pressure chamber into the high-pressure chamber, so that the interior of the high-pressure chamber remains filled with the hydraulic fluid;

- the valve element colliding against a valve seat face of the valve port every time the valve element opens or closes the valve port;

- the valve element is made of a steel having a large specific gravity, for example, SUJZ.

(Page 1 and 2, paragraphs 2-4, specification disclosing prior art conventional lash adjuster).

Applicant's admitted prior art fails to disclose the valve seat face being convex and arcuate, the valve element made of a ceramic containing silicon nitride, and the biasing of the valve element being a spring.

Edelmayer et al. teach a hydraulic lash adjuster with a check ball 53 operable to engage a valve seat 55 defined by an arcuate convex curved surface for sealing between two pressure chambers, the contacting portions effectively forming a line or circle when viewed along the axis of the plunger to prevent wedging (column 4, lines 37-41; column 5, lines 27-34; column 6, lines 14-31; Figures 1-3), and a spring 69 for biasing the check ball 53 (column 4, lines 55-67 with column 5, lines 1-4), and a spring 33 for biasing the plunger assembly 15 outward (column 4, lines 42-46). It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the teaching by Edelmayer et al. in the prior art lash adjuster disclosed by the applicant, since the use thereof would help prevent wedging of the check ball with the valve seat, and identify the specific biasing means for closing the valve element.

Lane et al. disclose a check valve with a ball 128, 156, 180 preferably made from a light, hard material such as silicone nitride ceramic (column 6, lines 26-37, lines 53-62, column 7, lines 4-17, lines 50-52). Niwa et al. disclose a check valve with a ceramic ball of silicon nitride to improve wear resistance (column 1, lines 35-40, column 2, lines 15-18). It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the teaching by Lane et al. or Niwa et al. in the prior art lash adjuster disclosed by the

Art Unit: 3748

applicant, as modified by Edelmayer et al., since the use thereof would have provided a valve element more resistive to wear and longer operational use.

4. Claims 8, 9, and 11 are rejected under 35 U.S.C. 103(a) as being obvious over applicant's admitted prior art on pages 1 and 2, paragraphs 2-4, of the instant application, in view of Edelmayer et al., and further in view of Lane et al. or Niwa et al.

Applicant's admitted prior art, as modified by Edelmayer et al., and further modified by Lane et al. or Niwa et al., discloses the hydraulic lash adjuster cited above, however, fails to disclose specific hardness values or heat resistance temperatures of the ceramic containing silicon nitride.

Both Lane et al. and Niwa et al. disclose check valves with balls made of ceramic containing silicon nitride for the purposes of improving resistance to heat and frictional wear, the specific hardness and temperature resistance being a matter of obvious choice to one of ordinary skill depending on the speed of movement, contact parameters, etc. Moreover, there is nothing in the record which establishes that the application of such hardness and temperature resistance represents a novel or unexpected result (See *In re Kuhle*, 526 F.2d 553, 188 USPQ 7 (CCPA 1975)).

Response to Arguments

5. Applicant's arguments with respect to claims 3 and 11 have been considered but are moot in view of the new ground(s) of rejection.

6. Applicant's arguments regarding the material used for the valve element being ceramic with silicon nitride are moot in view of the above cited references to Lane et al. and Niwa et al.

On top of page 5, line 3, applicant argues that Edelmayer et al. teach biasing the ball in the

Art Unit: 3748

opening direction. The applicant's admitted prior art already cites biasing the ball in such a direction that it closes the valve port (see above), the Edelmayer et al. reference being relied upon only for the teaching of the convex arcuate seat face. Applicant also argues on page 6, middle of the page, that the arcuate valve seat face identified by the examiner is actually concave and not convex. Examiner disagrees. Figures 2 and 3 of Edelmayer et al. clearly show the ball 53 making contact (valve seat face) on a surface that is arced outwards toward the ball (convex) which is substantially the same as applicant's (see applicant's Figures 2, 3, and 4). The arguments concerning the Taniguchi et al. reference on pages 7 and 8 are moot in view of the newly cited references above.

Communication

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kyle M. Riddle whose telephone number is (571) 272-4864. The examiner can normally be reached on M-F (07:30-5:00) Second Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Denion can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

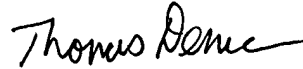
Application/Control Number: 10/784,961
Art Unit: 3748

Page 7



Kyle M. Riddle
Examiner
Art Unit 3748

kmr



THOMAS DENION
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3700